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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,388	03/12/2004	Igor Seleznev	0492611-0545/MIT9277CON2	7295
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CHOATE, HALL & STEWART LLP TWO INTERNATIONAL PLACE BOSTON, MA 02110			EXAMINER WARTALOWICZ, PAUL A	
			ART UNIT 1735	PAPER NUMBER
			NOTIFICATION DATE 06/10/2011	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/799,388

Applicant(s)

SELEZNEV ET AL.

Examiner

PAUL WARTALOWICZ

Art Unit

1735

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 40, 42-44, 46, 47, 49-62, 85 and 90-94 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 40, 42-44, 46, 47, 49-62, 85 and 90-94 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/23/10 has been entered.

Response to Arguments

Applicant's arguments filed 12/23/10 have been fully considered but they are not persuasive.

Applicant argues that Smith does not teach the use of a processing gas which has both a moisture content of less than 1% by mass and a total pressure of less than 8 Torr.

However, it appears that the combined prior art (specifically the sole lost count in view of Smith) appear to meet the limitation of the use of a processing gas which has both a moisture content of less than 1% by mass and a total pressure of less than 8 Torr as described in the rejection below.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 47 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation in claim 47, line 1 of "consists substantially" renders the claims indefinite. It is unclear whether "consists substantially" is equivalent to "comprising" or "consisting essentially of". Therefore, the metes and bounds of claim 47 are indefinite. For the purposes of examination, "consists substantially" is interpreted as "comprising".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 40, 42-44, 46, 47, 49-62, 85, 90-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over the sole lost count of Patent Interference No. 105,406 in view of Fritzemeier (US 6797313) and Smith (US 6172009).

The combination of the sole lost count and Rupich are generic to the subject matter of the sole lost count of Patent Interference No. 105,406, as to which a judgment adverse to the applicant has been rendered. A losing party is barred on the merits from seeking a claim that would have been anticipated or rendered obvious by the subject matter of the lost count. *In re Deckler*, 977 F.2d 1449, 24 USPQ2d 1448 (Fed. Cir. 1992); *Ex parte Tytgat*, 225 USPQ 907 (Bd. Pat. App. & Inter. 1985). See also MPEP §2308.03.

The subject matter of the lost count sets forth heat-treating said precursor film (comprising barium, fluorine, yttrium, and copper) at a temperature above about 700°C in the presence of oxygen. One of ordinary skill in the art would recognize heat-treating would begin at room temperature and then rise to a temperature of above 700°C. As the temperature is increased to above 700°C, the precursor with oxygen present will be processed at a temperature of 400°C that will inherently form an oxyfluoride film wherein the temperature is subsequently raised to a temperature of above 700°C in order to convert the oxyfluoride precursor to the superconducting material. It is stated in the specification that this is believed to be the mechanism that occurs during treatment of the precursor with oxygen at elevated temperatures (2005/0014652 [0036] and 2004/0171494 [0035]). Therefore, the specification supports the assertion that the oxyfluoride precursor film is formed in the process of the subject matter of the lost count.

The subject matter of the lost count recites forming a film of crystalline $\text{YBa}_2\text{Cu}_3\text{O}_7$. The subject matter expressly states the ratio of the elements present in the

superconducting material. One of ordinary skill in the art would recognize that it would have been obvious to one of ordinary skill in the art to provide the elements in substantially stoichiometric amounts to produce the compound as claimed.

It appears that the specification describes the formation of the intermediate metal oxyfluoride compound as the mechanism by which the invention, and therefore the lost count, is carried out.

The subject matter of the lost count recites "heat-treating said precursor film at a temperature above 700°C in the presence of oxygen and water vapor at a sub-atmospheric pressure to form a crystalline structure" (emphasis added). Therefore, it is also maintained that HF is inherently removed at the conditions required by the subject matter of the lost count (presence of oxygen and water vapor, reduced pressure, 700°C).

The lost count additionally teaches the film thickness of claims 50 and 51 (claim 159), and regarding claim 54, that the superconductor is YBCO (claim 143).

Regarding claim 40, the lost count fails to teach that the substrate is biaxial textured.

Fritzsche, however, teaches a method of making YBCO superconductors (col. 2) wherein a metal substrate is biaxially textured for the purpose of providing a crystallographic orientation to the superconducting layer (col. 2, 20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to biaxially texture a metal substrate of the lost

count in order to provide a crystallographic orientation to the superconducting layer as taught by Fritzemeier.

Regarding claim 40, the sole count fails to teach the oriented oxide superconducting film exhibits c-axis texturing.

Fritzemeier, however, teaches a method of making YBCO superconductors (col. 1) wherein the superconductor film exhibits c-axis texturing (col. 3).

Smith teaches a method of making superconductors (col. 1) wherein the superconductor comprises c-axis epitaxy for the purpose of providing high J_c values (col. 5).

As Fritzemeier teaches a superconductor film exhibits c-axis texturing and Smith teaches that a superconductor comprises c-axis epitaxy for the purpose of providing high J_c values, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the superconductor film of the lost count having c-axis epitaxy (texturing) in order to provide high J_c values.

Regarding claims 40, 42-44, and 46, the subject matter of the lost count recites that the "presence of oxygen and water vapor at sub-atmospheric pressure" (see claim 143 of the lost count). It appears that the values of less than 8, 1, 0.1, 0.01, and 0.001 Torr lie inside the range of sub-atmospheric pressure (i.e. less than 760 torr). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claims 40 and 93, the sole lost count fails to teach the limitation of initiating conversion of the metal oxyfluoride into the oxide superconductor in a

processing gas having a moisture content of less than 1% by mass (claim 40) and completing conversion of the metal oxyfluoride into the superconductor in a processing gas having a moisture content greater than in the step of initiating conversion and a total pressure less than about 8 Torr (claim 93).

Smith, however, teaches that oxyfluoride films are converted to YBCO superconductor films in an atmosphere including initiating conversion of the oxyfluoride film at a moisture level of 0.6% water at room temperature (appears to be substantially equivalent to 0.6 % mass; col. 3, lines 40-55; col. 19, lines 5-22; fig. 14) and completing the conversion at a moisture level of 95% at room temperature for the purpose of providing a critical current density greater than 10^5 A/cm² at 77K (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the oxyfluoride film of the lost count converted to YBCO superconductor films in an atmosphere including initiating conversion of the oxyfluoride film at a moisture level of 0.6% water at room temperature (appears to be substantially equivalent to 0.6 % mass; col. 3, lines 40-55; col. 19, lines 5-22; fig. 14) in order to provide a critical current density greater than 10^5 A/cm² at 77K (Abstract) as taught by Smith.

Specifically regarding claim 40, it appears that 0.6% mass anticipates and/or renders obvious the range of less than 1% mass.

Specifically regarding claim 93, as Smith teaches that the step of initiating the conversion takes place in an atmosphere of 0.6% mass and the step of completing conversion occurs in a moisture level of 95% and the sole lost count recites that the

environment of the conversion is sub-atmospheric (which includes less than 8 Torr), the lost count in view of Smith meets the limitation of completing conversion of the metal oxyfluoride into the superconductor in a processing gas having a moisture content greater than in the step of initiating conversion and a total pressure less than about 8 Torr.

Regarding claim 47, the sole last count recites that the precursor film is processed in an environment of water vapor and oxygen (claim 143).

Regarding claims 49 and 85, the lost count does not teach that a buffer layer deposited on the substrate before the superconducting layer is deposited (claim 85) and that the buffer layer comprises yttria-stabilized zirconia, inter alia (claim 49).

Fritzemeier teaches a method of making YBCO superconductors wherein a buffer layer (cerium oxide, inter alia, col. 27) wherein a buffer layer is deposited on a substrate before depositing a YBCO superconductor to prevent substrate elements from migrating to the surface of the intermediate layers (col. 20, 21).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to deposit a buffer layer of cerium oxide, inter alia, on a substrate before depositing a YBCO superconductor of the lost count in order to prevent substrate elements from migrating to the surface of the intermediate layers as taught by Fritzemeier.

Regarding claims 52-53, the subject matter of the lost count requires that the thickness of the film is at least 0.5 microns (see claim 159 of the lost count). It appears that the values of 0.8 and 1.0 microns lie inside of the range of at least 0.5 microns. In

the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claims 55 and 56, the sole lost count teaches that the substrate is a ceramic including SrTiO_3 (claims 145,146).

Regarding claims 57 and 58, the sole lost count teaches that the substrate comprises a metal including nickel (claims 145, 149).

Regarding claims 59-62, the subject matter of the sole count requires that the critical current density is about 0.1 MA/cm^2 or greater. It appears that range of greater than $0.45, 1, 2, 4 \text{ MA/cm}^2$ overlap with the range of the lost count, 0.1 MA/cm^2 greater. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

In the alternative regarding claims 59-62, Fritzsche teaches that parameters, such as superconductor thickness, are varied for the purpose of providing a critical current density of at least about $2 \times 10^6 \text{ A/cm}^2$ (col. 7). It appears a critical current density of at least about $2 \times 10^6 \text{ A/cm}^2$ (col. 7) overlaps with the claimed ranges of claims 59-62. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claims 90-92, Smith teaches that oxyfluoride films are converted to YBCO superconductor films in an atmosphere including initiating conversion of the oxyfluoride film at a moisture level of 0.6% water at room temperature (appears to be substantially equivalent to 0.6 % mass; col. 3, lines 40-55; col. 19, lines 5-22; fig. 14) as described above. Additionally, the sole lost count teaches that the heat-treatment takes

place at sub-atmospheric pressure (claim 143) which would include total pressures of less than 8 Torr. Based on the amount of water vapor present in the environment (0.6 % of the total mass) as taught by Smith and the total pressure being less than 8 Torr, it appears that the water partial pressure during the step of initiating conversion overlaps with a range of less than 10 mTorr (claim 90), less than 5 mTorr (claim 91), and less than 1 mTorr (claim 92). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claim 94, Smith teaches that oxyfluoride films are converted to YBCO superconductor films in an atmosphere including completing conversion of the oxyfluoride film at a moisture level of 95% water at room temperature (appears to be substantially equivalent to 95% mass; col. 3, lines 40-55; col. 19, lines 5-22; fig. 14) as described above. Additionally, the sole lost count teaches that the heat-treatment takes place at sub-atmospheric pressure (claim 143) which would include total pressures of less than 8 Torr. Based on the amount of water vapor present in the environment (95% of the total mass) as taught by Smith and the total pressure being less than 8 Torr, it appears that the water partial pressure during the step of completing conversion overlaps with a range of 150-350 mTorr (claim 94). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica L. Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul A Wartalowicz/
Examiner, Art Unit 1735